

Remarks

Claims 23-24, 26-28, 30, 32, 33, and 35-39 are pending in this application. Applicants have amended claims 38 and 39 to clarify the claimed invention. Applicants respectfully request favorable reconsideration of this case.

Applicants present herewith one sheet of corrected drawings including Fig. 4(a) to which Applicants have added reference character 10 to identify the bearing surface of the bearing member 3, reference character 9 to identify the ball of the ball-and-socket joint, and 11 to identify the surface of the ball and socket joint. Applicants have also amended page 3 of the specification to include the reference characters. Since Applicants have merely added reference characters to what is already illustrated, these amendments do not represent new matter. Accordingly, Applicants respectfully request approval of the corrected drawings.

Applicants wish to point out that the drawings and specification describe "at least one removable polymeric friction minimizing annual bearing member" 3, a "housing surface" 4, and "a plurality of friction-increasing grooves" 5'.

The claims no longer recited "driving means". However, it is quite clear from the description that the driving means that can drive such a robot is identified in the corrected drawings submitted July 8, 2008, as element 6 in Fig. 5. This drawing is taken from U.S. patent 4,976,582 to Clavel, which states that the links and rods may be moved by actuators and motors. The present specification does not further describe the driving means nor do the drawings of the

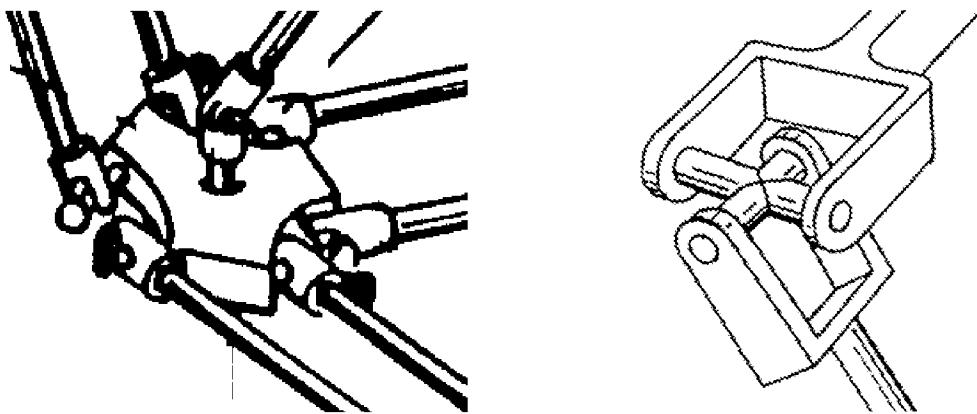
present application further illustrate the driving means. The driving means was not being recited as part of the invention recited in claims 38 and 39. Rather, claims 38 and 39 simply recited that when the elements of the system are driven, or moved, the elements of the invention, including the bearing member and housing will not move relative to each other.

The Examiner has previously rejected claims 23, 24, 26-28, 30, 32, 33, and 35-39 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 4,976,582 to Clavel in view of U.S. patent 2,733,085 to Latzen and U.S. patent 4,430,016 to Matsuoka.

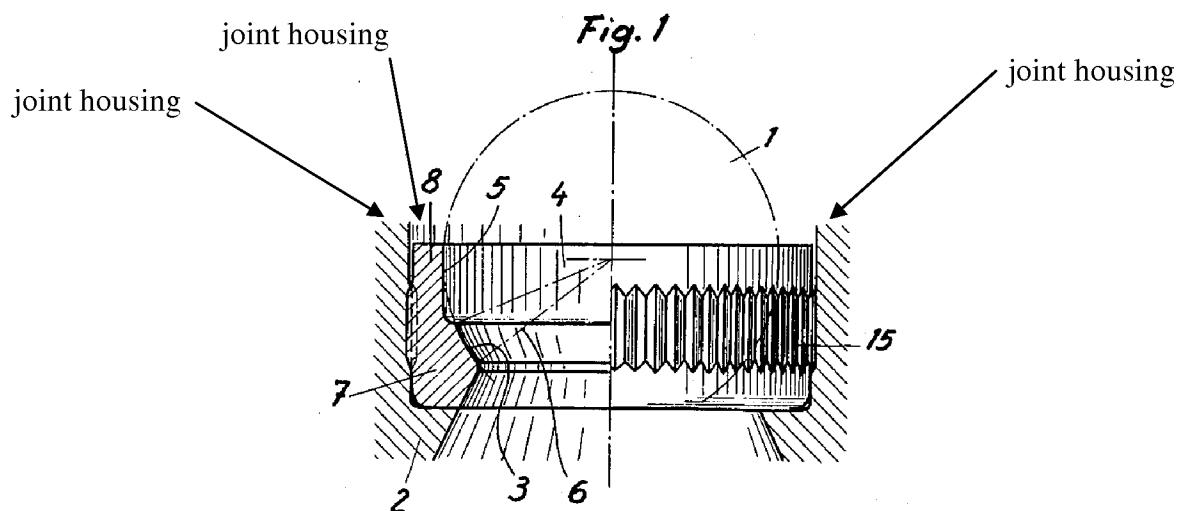
The combination of Clavel, Latzen and Matsuoka does not suggest the invention recited in claims 38 or 39, since, among other things, the combination does not suggest a joint socket and joint housing enclosing a joint ball with a space approximately one-half the ball or less. The combination also does not suggest a ball and socket joint that includes a bearing member that engages only a distal half of each joint ball or only a portion of the distal half of each joint ball and only a portion of a proximal half of each joint ball.

Clavel does not suggest the ball and socket joint according to the claimed invention. Below are reproduced the joints suggested by Clavel. As can be seen in both of these views, Clavel suggests cardan joints, which are multi-element linkages. Clavel describes these joints as col. 4, lines 13-17. Cardan joints are couplings using a double yoke and four-point center cross. Cardan joints are used as couplings in the driveshafts of rear-wheel drive cars, but can produce uneven shaft speeds when operated at joint angles of more than a few degrees. Cardan joints include many moving parts that result in inherent high friction and complexity in changing any

parts. Such a joint does not suggest the ball and socket joint of the claimed invention.



Latzen suggests joints that virtually completely envelop the ball. One example of such a joint is shown in Fig. 1, which is reproduced below. It is important to recognize that Fig. 1 and the other figures illustrate cut-away views of the joints, as indicated in by the arrows in Fig. 1 as reproduced below, and that the joint housing 2 extends about the entire ball head. Fig. 2 illustrates a similar view and Figs. 3 and 4 illustrate a non-cut away views of the housing almost entirely surrounding the ball.



Such joint housing that surrounds more than approximately one-half of the joint ball is

contrary to the claimed invention. Including such joints in a robot according to the claimed invention would severely limit the operation of the robot for a number of reasons. The joints suggested by Latzen would have much higher friction and simply physically limit the movement of the ball and socket relative to each other. Additionally, it would be quite complicated and not at all obvious to replace the bearing member of the joint suggested by Latzen as is possible to replace the bearing member according to the claimed invention.

To interpret the cut-away view of Latzen as suggesting a structure that does surrounds one-half of a ball joint or less consciously ignores the contents of the written description and drawings of Latzen. Simply because a cut-away view does not illustrate elements of an invention does not mean that the elements not shown in the cut-away view do not exist. It is a creation of the Examiner that structures not shown in the cut-away views do not exist. The cut-away views clearly do not show the claimed structure since the parts not shown in the cut-away views are still present. Latzen does not "intend" for the housing to entirely surround the ball of the joint, the ball is entirely surrounded by the structure. Latzen has chosen not to illustrate the entire structure in the drawing. The interpretation of the figure by the Examiner is unfounded in the specification and drawings and does not exist.

In view of the above, Clavel concretely defines and illustrates the joints that are utilized in the robot. It is not apparent how such a joint could be replaced with the limited motion joint suggested by Latzen. Nor is it clear how such a combination suggests the claimed invention.

Matsuoka et al. similarly suggests a socket structure that entirely surrounds the ball.

The arrangement of the claimed invention minimizes friction and provides the delta robot with a desired degree of freedom of movement of the delta robot. Additionally, the claimed invention provides a low weight design that can have a stroke time of about 0.5 sec. The claimed invention also provides an easily replaceable bearing means that may be exchanged regularly to achieve minimized uneven wear.

The joint socket of the invention recited in claims 38 and 39 encloses the joint ball with a space approximately one-half the ball or less. Such a structure permits quick disassembly of the joint and change of the bearing member. Since the socket structure of both Latzen and Matsuoka et al. surround the ball of the ball and socket joint, not only would the structures not provide the degree of movement possible with the structure according to the claimed invention, but they would also not provide the possibility to easily disassemble the joint and quickly change the bearing member.

By only enclosing approximately one-half of the ball or less the invention recited in claims 39 and 39 provides minimal friction in the joint, which helps to provide the robot with a quick stroke time, which may be on the order of about 0.5 seconds. In spite of only covering approximately one-half of the ball or less, the claimed invention the bearing member is firmly fixed in the socket of the joint, such that the joint can withstand the rotational and directional movements that such joints encounter in use.

In view of the above, the combination of Clavel, Latzen and Matsuoka does not suggest

the invention recited in claims 38 or 39 or claims 23-28, 30, or 32-37, which depend therefrom.

Therefore, the references relied upon in the office action, whether considered alone or in combination, do not suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not make the claimed invention obvious. Accordingly, Applicants respectfully request withdrawal of the rejections based upon the cited references.

In conclusion, Applicants respectfully request favorable reconsideration of this case and early issuance of the Notice of Allowance.

If an interview would advance the prosecution of this case, Applicants urge the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Dated: October 26, 2009

Respectfully submitted,

Electronic signature: /Eric J. Franklin/
Eric J. Franklin
Registration No.: 37,134
VENABLE LLP
P.O. Box 34385
Washington, DC 20043-9998
(202) 344-4000
(202) 344-8300 (Fax)
Attorney/Agent For Applicant